Voluminous lava flows at Oldoinyo Lengai in 2006: chronology of events and insights into the shallow magmatic system

Author(s)

Matthieu Kervyn
Gerald G. J. Ernst
Jurgis Klaudius
Jörg Keller
François Kervyn
Hannes B. Mattsson
Frederic Belton
Evelyne Mbede
Patric Jacobs

Abstract

The largest natrocarbonatite lava flow eruption ever documented at Oldoinyo Lengai, NW Tanzania, occurred from March 25 to April 5, 2006, in two main phases. It was associated with hornito collapse, rapid extrusion of lava covering a third of the crater and emplacement of a 3-km long compound rubbly pahoehoe to blocky aa-like flow on the W flank. The eruption was followed by rapid enlargement of a pit crater. The erupted natrocarbonatite lava has high silica content (3% SiO_2). The eruption chronology is reconstructed from eyewitness and news media reports and Moderate Resolution Imaging Spectroradiometer (MODIS) satellite data, which provide the most reliable evidence to constrain the eruption's onset and variations in activity. The eruption products were mapped in the field and the total erupted lava volume estimated at $9.2 \pm 3.0 \times 10^5$ m^3. The event chronology and field evidence are consistent with vent construct instability causing magma mixing and rapid extrusion from shallow reservoirs. It provides new insights into and highlights the evolution of the shallow magmatic system at this unique natrocarbonatite volcano.

Keywords

Oldoinyo LengaiHornito collapseLava flowCollapse pitMODLEN